

Appl. No. 09/601,004
Amdt. dated October 31, 2005
Reply to Office action of June 30, 2005

In the Claims:

Claims 1, 2, 4 are amended herein. Claims 3, 5, 7 and 8 are canceled. The remaining claims are not amended.

1. (currently amended) A two variable data interpolation system for processing image data, wherein a an image value between a plurality of discrete image data values is interpolated by performing convolution operation corresponding to the plurality of discrete data positioned at equal intervals in a two dimensional space using a sampling function that is differentiable finite times and has values of a local support, wherein, with letting a third order B spline function be F(t), the sampling function, (H(t)), is defined as follows:

$$H(t) = -F(t + 1/2)/4 + F(t) - F(t - 1/2)/4.$$

2. (currently amended) The two variable data interpolation system according to claim 1, wherein the sampling function is a function that can be differentiated is differentiable only once over a whole region.

3. (canceled)

4. (currently amended) The two variable data interpolation system according to claim 3 1, wherein the third order B spline function F(t) is expressed as follows:

$$(4t^2 + 12t + 9)/4 \quad ; -3/2 \leq t < -1/2$$

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$$-2t^2 + 3/2 \quad ; -1/2 \leq t < 1/2$$

$$(4t^2 - 12t + 9)/4 \quad ; 1/2 \leq t < 3/2.$$

5. (canceled)

6. (previously presented) A two variable data interpolation system, wherein a value between a plurality of discrete data is interpolated by performing convolution operation corresponding to the plurality of discrete data positioned at equal intervals in a two dimensional space using a sampling function that is differentiable finite times and has values of a local support,

wherein, with letting a third order B spline function be $F(t)$, the sampling function, $(H(t))$, is defined as follows:

$$H(t) = -F(t + 1/2)/4 + F(t) - F(t - 1/2)/4, \text{ comprising:}$$

discrete data extracting unit for extracting a plurality of discrete data that exist within a predetermined range around a data interpolating position that becomes an object of interpolation operation;

sampling function operating unit for calculating a value of the sampling function $H(t)$ for each of a plurality of discrete data extracted in this manner, with letting distance between the data interpolating position and discrete data be a t ; and

convolution operating unit for obtaining a value of the data interpolating position by performing convolution operation through adding values of the sampling function that are

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calculated by the sampling function operating unit and correspond to the plurality of discrete data respectively.

7. (canceled)

8. (canceled)